

## PLANIMETER *INTEGRATES PREVIOUSLY RECORDED VARIABLES*

The Royson Strip Chart Planimeter provides a simple means for rapidly integrating records that have already been made. It is widely used for integrating flow on the narrow strip charts used in process control systems. The wide strip charts commonly used on chromatographs and densitometers can be integrated to get the area under the peaks. By integrating after the record has been made, it is possible to draw in a base line and reset the zero before planimetering the record.

### OPERATION

The curve is followed by manually turning the large knob which moves the follower index and the integrator input at the same time. For charts less than six inches in width, the follower index is on a rack and pinion operated by the knob. For wider charts, the follower index is on a cable, also operated by the manual knob. Use of the cable minimizes the size of the cabinet for wide charts.

The chart is power fed through the Planimeter by a variable speed drive controlled by a foot pedal. The variable speed permits running fast with smooth curves and slowly for the more complex curves. When long charts are run, the chart is automatically taken up by a power driven take-up spindle. Shorter lengths of chart can be run directly through without rewinding. Hand cranks are provided on the supply spindle so that the chart can be rewound to its original condition.

The output is totalized on a five digit counter. A knob on the left side of the case permits manual reset of the counter to zero.

The strip charts can be run in the condition as re-wound on the original recorder or after a second re-winding. It is merely necessary to turn the cam over so that the zero is on the opposite side.

Linear, square root, or logarithmic charts can be integrated. The same Planimeter can handle these different calibrations by merely changing a cam that is accessible through the bottom of the Planimeter.

### ACCURACY

The accuracy is well within the limits of the ability to follow the curve. If the curve could be followed with absolute fidelity, the error should not exceed 0.5% on a linear chart. With a square root or logarithmic chart, this accuracy can be obtained over the upper 80% of the chart. With average following, the total should always be within 1% of full scale. On square root charts this figure may run two or three percent over the bottom 20% of the chart.

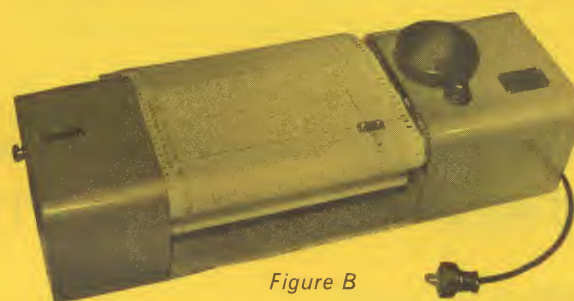
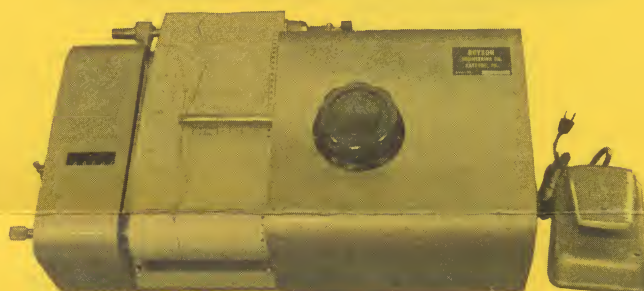


Figure B

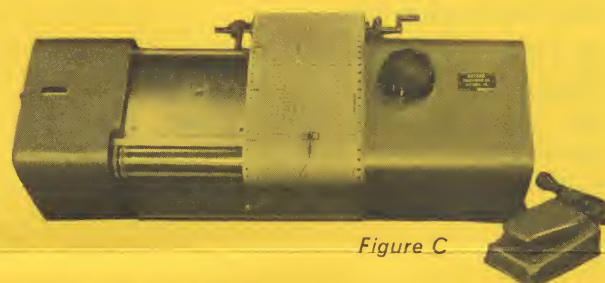


Figure C

### TYPES OF CHARTS THAT CAN BE HANDLED

The Planimeter can be supplied for any chart that has sprocket holes along at least one edge. This is necessary in order to give a positive relationship between the chart and the drive drum as this is part of the computation of the integral. In many cases, several different makes of recorder charts can be handled on the same Planimeter. It is merely necessary that the sprocket holes on at least one edge be compatible. As an example, figure B shows a Planimeter for a 12" strip chart. Figure C shows a similar wide chart Planimeter with a narrow chart being run. The supply spindles on the back of the Planimeter are adjustable when these types of combinations are used. If there is any question, samples of the chart should be submitted to Royson Engineering to be certain that they are compatible.



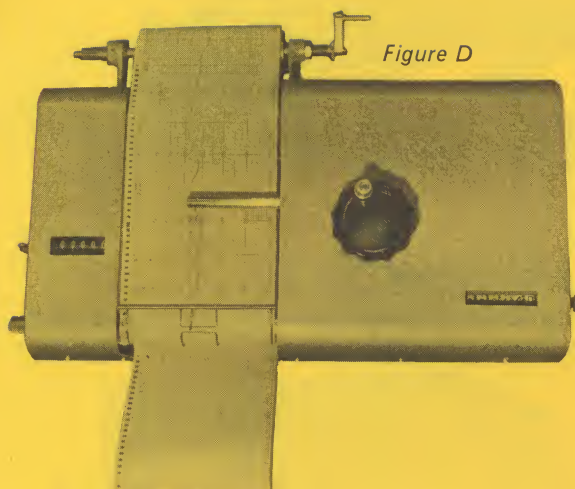


Figure D

### CHART LENGTH INDICATOR

Figure D shows a narrow chart Planimeter with a counter in the lower right hand corner to indicate the length of chart that has been run through the Planimeter. When integrating flow records, this feature eliminates the necessity for counting off chart hours or length.

### PRICES

4 inch Planimeter	<del>\$595.00</del>	\$655.00
6 inch Planimeter	<del>\$670.00</del>	\$745.00
12 inch Planimeter	<del>\$745.00</del>	\$860.00
Extra for Chart Length Indicator	<del>\$ 75.00</del>	\$115.00

The above prices include one cam for any type of calibration. Additional cams are priced at \$50.00 each. Accordingly, if a Planimeter is ordered for a linear and a square root calibration on the same instrument, add \$50.00 to the above prices.

Because of variation in charts from different recorders, the Planimeter is custom built to a large extent. Accordingly, special features can often be provided at modest additional cost.

**Note:** When ordering, send a sample of the chart you are using to be certain of correct Planimeter construction.

## OTHER ROYSON INSTRUMENTS

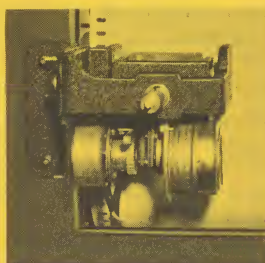
### LECTROCOUNT

#### Electronic Integrator

Operates from voltage or slide wire input. Choice of many input and output combinations for chromatography, densitometry, totalizing kilowatt and ampere hours and as an analog to digital converter. Ask for Bulletin 231-1.

### IDENTICHARTS...

eliminate chart watching and marking. Identicharts print serial numbers, code numbers or letters, date and time, or numerical count on strip charts — from a remote point, automatically and accurately.



### PNEUMATIC INTEGRATOR

Converts 3 to 15 psi air pressure into contact closures whose rate is proportional to the input pressure. Output rates up to 500 counts per minute can be supplied.

### PRINTERS AND MARKERS

For automated, remote control printing of numbers, date and time, and other data. Consult us on any special requirements you may have for printing or marking.

# ROYSON

## ENGINEERING COMPANY

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